Underground News

Providing Information to the Water Well, UIC & Underground Hydrocarbon Storage Industries in Kansas

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ROCK CORING AT UNDERGROUND HYDROCARBON STORAGE WELL FACILITIES

by Mark Jennings, L. G.

One of the requirements for the final permit application for underground storage well facilities is that data from a rock core be submitted for the salt and overlying shale layers. For several facilities, data from existing cores is available and has been determined to be acceptable by KDHE. Cores, however, are required for two storage areas for which there is no existing core data. During January a core was taken at Conway, in McPherson County, and another several miles west at Mitchell, in Rice County. At each location, several hundred feet of continuous core were cut from the lower Ninnescah Shale through the upper Wellington Formation and the Hutchinson Salt Member of the Wellington. The Hutchinson Salt Member is host to all of the solution-mined storage caverns in Kansas.

Coring operations continued around the clock using wireline coring equipment. A four-inch diameter core was cut, large enough to provide samples for strength tests on the rock. The core was cleaned, logged, photographed and boxed on site by a geologist. Core recovery was excellent, with about a 99 percent recovery rate reported for the Conway core. Select samples of the roof rock (Wellington Formation shales) and the Hutchinson Salt interval were specially packaged and sent to a laboratory for mechanical tests. Data from these tests will be used to confirm the salt and overlying rocks have the strength necessary for safe development and operation of underground hydrocarbon storage caverns.

After the coring operation was complete, the holes were logged with a suite of geophysical logs, including gamma ray, bulk density, porosity, resistivity and sonic logs. After logging, zones of the borehole were then isolated with packers, and hydraulic fracture tests were conducted by pressurizing the rock and observing the pressure response. After all testing is completed, the holes will be plugged and abandoned. All core not used in the testing will be donated to the Kansas Geological Survey Core Library.

WATER WELL PROGRAM ENHANCES WEB SITE by Richard Harper, L.G.

The KDHE Water Well Unit continues to make enhancements to its part of the Geology Section Web site to provide better service to water well contractors, the public and other parties interested or needing information concerning water wells. As part of this activity, several additional Web sites have been added. One is a link to the Kansas Ground Water Association (KGWA). The KGWA is an organization that serves water well contractors, scientists, manufacturers and anyone interested in groundwater. KDHE licenses water well contractors and works with the KGWA since the KGWA represents the interests of water well contractors. An important function of the link to the KGWA Web site is that the KGWA keeps the industry informed of seminars and educational opportunities available for water well contractors to meet continuing education requirements required by the KDHE water well contractors license.

KDHE is also evaluating the possibility of placing a link on the Water Well Program Web site to a site which converts Global Positioning System (latitude and longitude) to a 10-acre tract legal descriptions. This information can then be used by the water well contractor to more accurately complete the location part of the WWC-5 well record filed by water well contractors with KDHE. KDHE also continues working with the Kansas Geological Survey (KGS) to provide information regarding all water wells constructed, reconstructed and/or plugged within the state since 1974 to be added to the KGS maintained water well data base. The link to the KGS water well database can be found on the Water Well Program Web site. We encourage you to visit the Water Well Program Web site at: www.kdheks.gov/waterwell/ and see the information that is available.

THE CYCLE OF INJECTION WELL LIFE by Kirk Hoeffner, L.G.

The life of a Class I disposal well in Kansas is typically a long one with some wells still in service after 50 years. With proper maintenance and care, these wells can last even longer. However, KDHE recently authorized the plugging and abandonment of the ConocoPhillips Class I well in Rago. This well had not been used since 1993, and the decision was made by the company to plug and abandon the well. This was the first Class I well plugged in Kansas since 1999. As the well is removed from KDHE's inventory of Class I wells, a new Class I well is being completed at the Deffenbaugh Landfill facility located in Johnson County. This well was permitted in 2002, but construction of the well did not begin until January 9, 2005. The Deffenbaugh well should be operational by May 2006. KDHE has been notified of plans to plug and abandon another Class I well in 2006. However, a facility located in Southwest Kansas is currently planning on installing their second Class I later this year. At this time, there are 48 active Class I disposal wells in Kansas. Kansas ranks third in the United States for the number of active Class I disposal wells according to the U.S. Environmental Protection Agency.

The life of a salt solution mining well (Class III UIC well) in Kansas is typically much shorter than a Class I well with an average life span of 15 to 20 years. The purpose of the well is to mine the amount of salt allowed by KDHE cavern dimension regulations. Once this is accomplished the well is generally of no further use. In 2004, a facility in south central Kansas plugged two salt solution mining well galleries consisting of five wells each. A new five-well gallery was then installed in 2004 and installation of another new five-well gallery began in February 2006 at this facility. KDHE has also been notified of plans for another solution mining facility to construct a new well gallery in 2007, and a Hutchinson facility constructed a new five-well gallery in 2005. The progression of replacement of mined wells with new production wells results in the number of active wells in KDHE's Class III well inventory remaining fairly constant. There are currently 139 active Class III salt solution mining wells in Kansas.

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Kansas Department of Health & Environment

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GEOLOGY SECTION COMPLIANCE UPDATE:

- *The UIC Program issued seven Notices of Violation for Significant Noncompliance during July 1, 2005 through December 31, 2005. These included directing motor vehicle waste to a septic system, annulus pressure below the minimum required for a Class I well and loss of mechanical integrity for a Class 1 well. All of these violations were promptly resolved.*

- *The Water Well Program has worked with the KDHE Legal Office to issue a Petition for Civil Enforcement, Praecipe, Summons and Return on Service of Summons to a Kansas Licensed Water Well Contractor who improperly constructed a water well and then ignored two different KDHE Administrative Orders issued to the contractor for the improperly constructed well. The well has been properly plugged and is no longer a threat to the public health or the environment.*

CARBON DIOXIDE SEQUESTRATION - IS INJECTION AN OPTION?

By Mike Cochran, L.G.

The increase of the carbon dioxide concentration in the earth's atmosphere, which is blamed by many for fueling a global climate change, is believed by many climatologists to be caused by the activities of humans. The United States and governments worldwide are examining methods to decrease the emission of carbon dioxide from man-made sources. One of the options being considered is carbon dioxide capture and then geologic storage of the captured carbon dioxide in deep, saline underground rock formations. This option brings up a slew of questions, concerns and issues such as: What would the classification of such an injection well be? Is this storage or disposal? How is containment ensured? What should the standards and requirements be? Where in the United States would this be feasible? KDHE, through its membership and active participation in the Ground Water Protection Council, which is an organization of state underground injection well regulators, is keeping in the loop as discussion continues on a national level to address the afore mentioned questions, concerns and issues. This is important since Kansas does have deep formations that might be considered as receptacles for captured carbon dioxide. It does appear at this time though, that the Texas Gulf Coast is one of the more promising areas for geologic sequestration of carbon dioxide due to the favorable geology and the high concentration of carbon dioxide sources such as coal fired power plants and petrochemical facilities.

REGULATORY AGENDA

by Mike Cochran, L.G.

The KDHE Geology Section is developing the following regulations:

Water Wells – Developing conceptual draft regulations for internal KDHE discussions addressing push type monitoring wells, flush mount completion and increasing fees.

UIC, Class III Injection Wells (Salt Solution Mining) – Modify existing regulations, including construction, testing, monitoring, permitting, reporting, operation and closure requirements and increase fees. Industry is still providing comments on the conceptual draft regulations.

UIC, Class V Injection Wells (Shallow) – Develop regulations clarifying prohibition of motor vehicle waste disposal wells and update definitions and inventory requirements. The common well types for motor vehicle waste and industrial waste disposal is a septic system or drywell. These regulations are now in the formal regulation adoption process and are at the Department of Administration for review.

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On the Inside . . .

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Did you know ... According to United States Geological Survey (USGS) figures, in the United States groundwater provides an estimated:

22% of all freshwater withdrawals
37% of agricultural use (mostly for irrigation)
51% of all drinking water for the total population
99% of drinking water for the rural population

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Visit our Web site for up-to-date information about what we are doing, new regulations, procedures, forms and reports. All this and more at: www.kdheks.gov/geo/

Member:

KGWA